

## Appendix K

### Northern Spotted Owl Data and Protocol





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## K. NORTHERN SPOTTED OWL DATA AND PROTOCOL

### K.1 Baseline Data

Table K-1 shows the baseline or historic productivity for northern spotted owls on covered lands or within 1000 ft of covered-land boundaries. MRC has only included in the baseline calculations spotted owls that we considered *active*. Prior to making our calculations, we sent information on *abandoned* owl territories to USFWS and CDFG; the agencies agreed that MRC should not include these territories in baseline calculations. Chapter 10 (10.3.1.2.2) has more detailed information on calculating baseline or historic productivity.

Table K-1 presents the baseline data for spotted owl productivity on MRC land from 1989 to 2007. Following are the codes that appear in Table K-1 under the annual columns for *Survey Years*:

Code	Definition
-	Year before territory is located or occupied
A	Territory was not monitored (although night-time surveying may have occurred)
U	Outcome unknown
X	Spotted owls absent from territory
0	Spotted owls present, no fledglings
1	One fledgling produced
2	Two fledglings produced

**Table K-1 Baseline Report for NSO Productivity on MRC Covered Lands**

ALBION																						
DFGID	Survey Years																		Total Production (minimum)	Years Data	Mean Annual Production (minimum)	Productivity Level
	90	91	92	93	94	95	96	97	98	99	00	01	02	03	04	05	06	07				
MD063	-	U	U	U	U	U	1	X	U	U	U	1	A	X	0	A	X	X	2	7	0.29	4
MD064	1	0	2	U	1	0	A	A	U	1	U	0	1	1	2	0	0	U	9	12	0.75	2
MD065	0	1	U	0	2	A	1	1	U	0	U	2	U	1	1	0	0	0	9	12	0.75	2
MD129	U	2	U	U	2	0	1	0	0	2	0	2	X	U	1	1	U	U	11	12	0.92	1
MD168	-	1	0	0	2	0	U	2	0	U	U	U	U	1	2	1	0	2	11	12	0.92	1
MD170	-	0	0	0	0	0	A	0	A	A	U	U	U	X	2	U	U	U	2	8	0.25	5
MD236	-	U	U	U	U	U	U	U	A	A	U	2	U	0	2	U	2	U	6	4	1.50	1
MD241	-	-	-	U	U	A	A	0	0	0	1	0	2	U	2	0	1	U	6	9	0.67	4
MD286	-	U	U	A	2	U	2	0	0	U	2	2	U	0	0	U	1	U	9	9	1.00	1
MD295	-	-	1	2	U	A	A	U	X	1	2	1	X	U	X	U	0	U	7	9	0.78	2
MD299	-	-	U	0	U	0	U	X	X	U	U	U	U	X	0	U	0	U	0	7	0.00	3
MD321	U	A	U	U	U	U	1	2	2	0	U	2	A	A	A	A	A	U	7	5	1.40	4
MD369	-	-	0	0	0	1	X	X	A	A	A	X	U	X	X	U	X	X	1	11	0.09	2
MD439	-	-	-	U	U	A	A	U	X	A	0	0	U	U	2	2	U	U	4	5	0.80	2
MD497	-	-	-	-	-	-	U	X	A	U	U	0	U	X	U	X	X	U	0	5	0.00	3
MD544	-	-	-	-	-	-	-	-	U	U	U	A	A	A	A	A	A	A	0	0	0.00	4
MD562	-	-	-	-	-	-	-	-	-	-	U	0	0	U	0	0	0	U	0	5	0.00	3
MD563	-	-	-	-	-	-	-	-	-	-	U	U	U	0	0	0	1	U	1	4	0.25	2
MD577	-	-	0	X	A	A	A	U	A	A	A	A	U	U	A	A	U	U	0	2	0.00	4
MD595	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	0	0	2	0.00	3
TOTALS																						
20	1	4	3	2	9	1	6	5	2	4	5	12	3	3	14	4	5	2	85	140	0.61	

**TABLE NOTE**

- NSO = northern spotted owl
- The term “NEW” denotes a territory located by MRC biologists but not yet given a “MENdocino” identification number by CDFG biologists. Once a territory receives this, its tag will change from “NEW” to its designated “MEN” number.

BIG RIVER																							
DFGID	Survey Years																			Total Production (minimum)	Years Data	Mean Annual Production (minimum)	Productivity Level
	89	90	91	92	93	94	95	96	97	98	99	00	01	02	03	04	05	06	07				
MD060	U	U	U	U	X	X	X	X	U	A	X	X	U	A	A	X	A	A	U	0	7	0.00	5
MD062	1	1	U	U	U	2	U	U	2	1	1	2	2	A	U	2	A	A	U	14	9	1.56	4
MD067	U	1	0	1	X	2	U	X	0	U	0	A	2	2	U	U	0	X	0	8	13	0.62	2
MD068	U	1	1	U	1	0	U	2	U	U	X	X	X	U	U	U	U	U	U	5	8	0.63	2
MD069	1	1	1	2	1	0	U	0	U	U	0	U	2	1	U	1	U	0	0	10	13	0.77	2
MD070	U	U	U	A	A	A	A	A	1	X	X	X	X	X	A	A	X	X	U	1	8	0.13	2
MD071	U	0	0	X	0	0	U	1	2	U	0	U	1	U	U	U	U	U	0	4	10	0.40	2
MD072	-	0	1	0	U	1	2	U	A	U	U	U	X	X	U	X	U	A	U	4	8	0.50	2
MD076	0	0	2	U	U	0	A	A	U	U	0	2	0	1	0	0	U	X	X	5	12	0.42	2
MD079	-	0	2	0	0	0	0	1	U	U	U	X	X	0	U	2	U	U	U	5	11	0.45	2
MD080	U	0	0	2	U	U	A	A	A	A	X	U	X	0	X	X	U	U	X	2	9	0.22	2
MD239	-	-	-	0	U	X	A	U	A	A	A	1	1	2	U	1	A	X	A	5	7	0.71	5
MD301	U	U	0	0	1	2	0	1	A	A	A	A	0	A	X	1	0	U	0	5	11	0.45	2
MD358	-	-	-	U	A	A	A	A	A	A	A	1	2	U	1	2	U	1	0	7	6	1.17	1
MD438	-	-	-	0	U	2	U	U	0	0	0	U	2	U	U	0	1	U	0	5	9	0.56	2
MD477	-	X	A	A	A	A	U	A	U	U	X	A	A	A	A	A	A	A	A	0	2	0.00	4
MD490	-	-	-	-	-	-	U	U	A	U	X	X	X	A	U	U	U	U	0	0	4	0.00	3
<b>TOTALS</b>																							
17	2	4	7	5	3	9	2	5	5	1	1	6	12	6	1	9	1	1	0	80	147	0.54	

GARCIA																							
DFGID	Survey Years																			Total Production (minimum)	Yea rs Data	Mean Annual Production (minimum)	Productivity Level
	89	90	91	92	93	94	95	96	97	98	99	00	01	02	03	04	05	06	07				
MD102	U	A	A	A	A	A	A	A	A	A	X	1	U	U	A	X	U	X	X	1	5	0.20	4
MD130	U	A	U	A	A	A	A	A	A	A	U	2	U	U	X	X	U	U	U	2	3	0.67	2
MD207	-	U	U	U	U	A	A	A	A	U	A	U	A	A	A	A	A	U	U	0	0	0.00	5
MD208	-	U	U	U	U	A	A	U	X	A	A	A	A	A	A	A	A	A	X	0	2	0.00	4
MD213	-	-	U	U	A	A	A	A	U	U	U	X	U	U	U	2	0	U	U	2	3	0.67	2
MD214	-	-	U	U	A	U	X	X	U	U	U	A	A	X	U	X	X	A	U	0	5	0.00	5
MD383	-	-	-	-	U	U	A	A	U	A	A	1	U	0	0	0	2	U	U	3	5	0.60	2
MD386	-	-	-	-	U	A	A	U	A	A	U	U	A	U	U	X	U	U	X	0	2	0.00	5
MD447	-	-	-	U	A	A	A	A	0	A	A	A	A	A	A	X	U	X	X	0	4	0.00	3
MD512	-	U	A	A	A	A	A	U	A	A	X	U	X	U	X	A	U	X	U	0	4	0.00	3
MD542	-	-	-	-	-	-	-	-	-	-	-	-	-	2	U	1	2	U	0	5	4	1.25	5
MD573	-	-	-	U	A	A	A	A	A	A	A	A	2	X	X	1	U	X	U	3	5	0.60	5
MD593	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	U	2	U	U	2	1	2.00	5
NEW017	-	-	-	-	-	-	-	-	-	-	-	-	-	-	X	U	X	X	U	0	3	0.00	3
TOTALS																							
14	0	0	0	0	0	0	0	0	0	0	0	4	2	2	0	4	6	0	0	18	46	0.39	



NAVARRO EAST																							
DFGID	Survey Years																			Total Production (minimum)	Years Data	Mean Annual Production (minimum)	Productivity Level
	89	90	91	92	93	94	95	96	97	98	99	00	01	02	03	04	05	06	07				
MD025	U	0	1	1	1	A	0	U	1	A	A	A	U	U	X	X	U	0	U	4	9	0.44	2
MD045	U	0	U	X	X	A	A	A	A	A	X	X	U	A	A	A	U	X	X	0	7	0.00	3
MD047	0	2	U	U	1	0	0	X	U	A	U	U	U	U	1	2	0	U	2	8	10	0.80	2
MD077	U	0	U	U	A	A	X	X	A	A	A	A	U	A	U	2	U	U	U	2	4	0.50	2
MD078	1	2	1	2	0	U	0	0	1	0	U	X	U	0	U	1	0	0	0	8	15	0.53	2
MD103	U	2	1	2	0	X	A	X	X	A	X	X	U	U	U	X	U	X	U	5	11	0.45	2
MD138	U	0	0	1	U	2	0	1	1	X	A	U	U	U	X	X	X	X	U	5	12	0.42	2
MD160	-	-	1	0	0	2	U	U	U	U	U	U	U	0	U	3	X	U	U	6	7	0.86	1
MD161	-	-	1	U	X	X	A	A	A	A	A	U	A	X	U	U	U	X	X	1	6	0.17	5
MD173	-	U	X	A	A	X	A	A	A	A	X	A	U	A	A	A	U	U	U	0	3	0.00	3
MD441	-	-	-	-	2	U	A	A	A	X	A	U	U	X	U	1	2	0	0	5	7	0.71	2
MD445	-	-	-	-	-	2	U	U	1	U	U	U	U	U	U	X	0	U	U	3	4	0.75	2
MD455	-	-	-	-	U	U	X	A	X	A	U	U	A	A	U	X	A	A	U	0	3	0.00	5
MD511	-	-	U	U	A	A	A	U	U	A	A	U	U	X	X	X	U	U	U	0	3	0.00	3
MD545	-	-	-	-	-	-	-	-	-	-	-	U	U	U	U	U	A	A	A	0	0	0.00	4
MD565	-	-	-	-	-	-	-	-	-	-	-	U	U	U	U	X	U	A	U	0	1	0.00	4
MD566	-	-	-	-	-	-	-	-	-	-	-	U	U	U	X	U	0	U	U	0	2	0.00	3
NEW015	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	1	0	0	3	4	0.75	2
NEW025	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	U	U	U	0	0	0.00	3
NEW026	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	U	U	U	0	0	0.00	3
NEW029	-	-	-	U	A	A	A	A	A	A	A	A	U	A	X	X	X	A	U	0	3	0.00	4
TOTALS																							
21	1	6	5	6	4	6	0	1	4	0	0	0	1	11	3	0	2	0	2	50	111	0.45	

NAVARRO WEST																							
DFGID	Survey Years																			Total Production (minimum)	Years Data	Mean Annual Production (minimum)	Productivity Level
	89	90	91	92	93	94	95	96	97	98	99	00	01	02	03	04	05	06	07				
MD022	1	1	0	U	U	A	A	A	A	A	A	U	1	U	0	U	0	2	U	5	7	0.71	2
MD023	2	0	0	2	0	2	U	0	0	2	0	0	2	0	U	1	2	U	0	13	16	0.81	1
MD024	1	1	U	0	0	X	U	X	X	A	A	U	0	1	U	0	0	0	U	3	12	0.25	2
MD053	0	2	1	2	0	U	A	1	2	A	U	U	1	0	U	X	U	X	U	9	11	0.82	1
MD066	2	0	2	1	1	U	1	A	2	U	0	0	U	2	U	2	2	U	1	16	13	1.23	1
MD125	-	0	2	1	1	1	1	A	A	A	A	U	2	2	0	2	2	U	U	14	11	1.27	1
MD126	-	0	1	0	X	U	A	A	A	A	A	A	A	X	X	X	X	U	2	3	9	0.33	2
MD127	-	U	2	2	0	A	A	X	U	A	A	U	2	2	U	0	1	U	1	10	9	1.11	1
MD141	-	0	U	U	X	A	X	A	A	A	A	X	A	A	A	A	A	U	U	0	4	0.00	5
MD178	-	-	U	2	U	A	1	U	U	U	A	U	U	0	U	2	1	0	1	7	7	1.00	1
MD222	-	-	U	A	A	A	A	A	A	A	X	A	A	A	A	A	A	A	U	0	1	0.00	5
MD442	-	-	-	2	0	2	U	X	U	U	U	U	0	2	U	1	2	0	2	11	10	1.10	1
MD443	-	-	-	0	0	1	0	U	A	A	A	A	U	X	X	X	U	2	U	3	8	0.38	2
MD444	-	-	-	-	1	1	1	A	A	A	A	U	2	U	U	2	0	0	0	7	8	0.88	1
MD489	-	-	-	-	-	-	0	U	A	2	0	2	0	1	U	2	1	U	U	8	8	1.00	1
MD518	-	-	-	-	-	-	-	0	2	0	2	0	2	0	U	X	U	U	2	8	9	0.89	1
MD521	-	-	-	-	-	-	-	-	U	A	U	U	U	U	X	X	U	X	U	0	3	0.00	5
MD534	-	-	-	-	-	-	-	-	-	0	U	1	0	1	U	2	U	0	U	4	6	0.67	2
MD549	-	-	-	-	-	-	-	-	-	-	-	U	1	0	U	X	U	1	U	2	4	0.50	2
MD552	-	-	-	-	-	-	-	-	-	-	-	U	U	U	X	U	1	U	U	1	2	0.50	2
MD575	-	-	-	-	-	-	-	-	0	A	A	A	U	U	U	2	U	1	U	3	3	1.00	1
MD594	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	U	0	U	0	1	0.00	3
NEW002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	U	X	U	U	U	0	1	0.00	3
NEW030	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	U	U	U	0	0	0.00	3
TOTALS																							
24	6	4	8	12	3	7	4	1	6	4	2	3	13	11	0	16	12	6	9	127	163	0.78	

NOYO																							
DFGID	Survey Years																			Total Production (minimum)	Years Data	Mean Annual Production (minimum)	Productivity Level
	89	90	91	92	93	94	95	96	97	98	99	00	01	02	03	04	05	06	07				
MD104	U	1	U	0	0	1	1	1	0	0	X	0	U	U	0	0	U	0	0	4	14	0.29	2
MD120	U	0	0	U	U	U	X	X	X	A	X	A	U	U	X	X	U	U	U	0	8	0.00	3
MD121	U	2	1	1	U	U	A	1	X	A	U	A	1	U	U	U	U	U	X	6	7	0.86	1
MD122	U	U	0	2	U	U	U	U	U	U	0	2	2	A	A	A	0	A	A	6	6	1.00	4
MD123	-	0	1	U	0	1	U	0	X	A	A	A	A	X	U	A	X	U	U	2	8	0.25	2
MD176	-	1	A	A	U	1	0	U	X	U	U	0	U	U	U	2	1	0	U	5	8	0.63	2
MD305	U	A	U	A	A	U	0	0	U	A	A	A	1	U	U	U	1	U	0	2	5	0.40	2
MD375	U	U	U	A	1	1	0	U	U	U	U	2	U	2	0	0	0	X	U	6	9	0.67	2
MD415	-	-	-	U	0	2	U	U	0	U	0	0	U	U	U	X	X	U	U	2	7	0.29	2
MD437	-	-	-	-	U	0	U	A	A	A	A	A	1	U	0	0	1	0	0	2	7	0.29	2
MD466	-	-	-	-	-	0	X	A	A	A	A	U	U	U	U	U	X	U	U	0	3	0.00	3
MD488	U	A	A	A	A	A	U	U	A	0	A	U	U	X	A	X	A	X	X	0	5	0.00	5
MD508	-	-	U	A	A	A	A	A	A	A	A	U	U	X	U	0	U	U	0	0	3	0.00	5
MD574	-	-	-	-	-	-	-	-	-	-	-	-	2	1	0	0	1	0	0	4	7	0.57	5
MD578	-	-	-	-	-	-	-	-	-	-	-	-	-	U	0	2	X	U	U	2	3	0.67	2
NEW020	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	X	U	U	0	1	0.00	3
TOTALS																							
16	0	4	2	3	1	6	1	2	0	0	0	4	7	3	0	4	4	0	0	41	101	0.41	

ROCKPORT																							
DFGID	Survey Years																			Total Production (minimum)	Years Data	Mean Annual Production (minimum)	Productivity Level
	89	90	91	92	93	94	95	96	97	98	99	00	01	02	03	04	05	06	07				
MD098	U	0	0	2	0	2	0	0	1	A	A	U	U	U	U	U	1	U	U	6	9	0.67	4
MD107	U	0	0	1	U	U	0	0	X	X	X	U	X	U	U	A	2	U	U	3	10	0.30	2
MD108	U	0	2	U	0	U	A	U	A	A	U	U	U	U	U	U	1	U	X	3	5	0.60	2
MD109	U	0	2	1	0	2	0	2	U	1	A	U	U	U	U	X	U	X	U	8	10	0.80	2
MD134	U	U	U	0	2	0	0	U	U	2	U	0	0	2	U	X	1	U	0	7	11	0.64	2
MD144	U	0	0	0	U	2	0	U	U	X	A	A	U	A	X	A	X	U	U	2	8	0.25	5
MD169	-	-	0	2	U	0	0	X	X	U	0	U	U	U	U	U	0	U	0	2	9	0.22	2
MD227	-	-	U	U	U	A	A	A	A	A	U	2	U	U	A	A	X	U	U	2	2	1.00	4
MD296	-	-	-	U	U	A	A	A	U	X	A	A	U	A	A	A	U	A	U	0	1	0.00	4
MD297	-	-	-	U	U	A	A	A	A	X	A	A	U	A	A	A	A	A	U	0	1	0.00	4
MD381	-	-	-	-	U	U	0	1	U	U	A	U	U	U	U	1	2	0	0	4	6	0.67	2
MD428	-	-	-	-	U	2	0	U	U	0	U	U	U	0	U	X	1	U	U	3	6	0.50	2
MD429	-	-	U	U	0	0	1	U	A	U	U	0	U	U	X	U	U	U	U	1	5	0.20	2
MD431	-	-	-	2	U	U	U	U	X	U	U	U	0	0	U	U	2	X	U	4	6	0.67	2
MD432	-	-	-	-	U	X	0	U	U	U	U	0	0	U	X	U	U	X	U	0	6	0.00	3
MD433	-	-	-	0	X	A	A	X	A	A	A	A	U	X	U	A	U	U	U	0	4	0.00	5
MD434	-	-	-	0	U	U	A	A	A	U	X	A	X	X	U	X	1	U	0	1	7	0.14	2
MD435	-	-	-	U	A	X	A	A	A	A	A	A	X	A	X	X	A	X	U	0	5	0.00	3
MD436	-	-	-	-	0	U	A	U	A	A	U	U	1	0	U	U	X	U	U	1	4	0.25	2
MD481	-	-	-	-	0	0	0	A	0	A	A	U	2	U	1	U	1	U	0	4	8	0.50	2
MD513	-	-	-	U	A	A	A	U	U	A	A	U	0	2	U	0	0	U	0	2	5	0.40	2
MD514	-	-	-	-	-	-	-	U	X	U	A	A	U	U	X	X	X	U	U	0	4	0.00	3
MD576	-	-	-	-	-	-	-	-	-	-	-	-	U	X	X	X	X	A	U	-	4	0.00	3
NEW023	-	-	-	-	-	U	A	A	A	A	A	A	A	A	A	X	X	X	U	0	3	0.00	3
NEW024	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	U	X	X	0	2	0.00	3
NEW028	-	-	-	-	-	-	-	-	-	-	-	-	U	X	X	X	X	U	U	0	4	0.00	3
NEW033	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	U	X	0	1	0.00	4
TOTALS																							
27	0	0	4	8	2	8	1	3	1	3	0	2	3	4	1	1	12	0	0	53	146	0.36	

SOUTH COAST																						
DFGID	Survey Years																	Total Production (minimum)	Years Data	Mean Annual Production (minimum)	Productivity Level	
	90	91	92	93	94	95	96	97	98	99	00	01	02	03	04	05	06	07				
MD089	0	1	U	U	U	U	X	A	U	U	U	U	0	X	1	U	U	U	2	6	0.33	2
MD090	0	1	X	X	U	U	X	X	A	A	U	U	X	X	X	U	X	U	1	10	0.10	2
MD143	U	A	A	A	2	A	A	A	U	0	U	U	2	X	2	U	U	U	6	5	1.20	1
MD162	-	-	-	U	U	0	1	U	U	A	U	X	U	U	U	U	1	U	2	4	0.50	2
MD182	-	-	-	-	U	A	A	U	A	2	U	1	0	U	0	1	U	U	4	5	0.80	2
MD183	-	0	2	U	1	A	U	1	A	1	U	U	2	X	2	0	U	U	9	9	1.00	1
MD199	-	0	U	U	2	A	1	2	U	A	U	2	U	U	2	1	1	0	11	9	1.22	5
MD200	-	U	A	0	2	A	U	2	A	A	A	A	U	A	2	2	2	U	10	6	1.67	1
MD201	-	U	U	U	U	A	A	U	A	U	U	1	U	U	X	U	U	U	1	2	0.50	2
MD220	-	2	2	0	2	A	A	U	A	A	A	U	U	U	2	U	U	U	8	5	1.60	1
MD221	-	U	U	U	1	U	1	U	U	U	U	A	A	A	A	U	U	A	2	2	1.00	4
MD260	-	U	A	U	A	A	U	A	U	A	U	U	U	A	A	U	X	X	0	2	0.00	3
MD261	U	A	A	2	2	U	0	0	U	U	U	U	0	1	2	U	X	U	7	8	0.88	1
MD288	-	U	U	U	1	0	A	A	U	A	X	U	U	U	1	2	2	0	6	7	0.86	5
MD289	-	U	A	A	0	0	2	A	U	A	U	U	2	U	2	2	0	0	8	8	1.00	1
MD382	-	-	-	U	A	A	A	A	A	A	A	U	U	U	2	U	U	U	2	1	2.00	1
MD384	-	-	-	U	U	A	A	A	A	A	A	U	1	1	U	U	X	0	2	4	0.50	4
MD385	-	-	-	0	A	A	1	X	U	U	U	X	U	1	U	U	0	0	2	7	0.29	2
MD387	-	-	-	U	A	U	U	U	A	1	U	0	2	U	U	2	2	0	7	6	1.17	1
MD396	-	U	1	U	U	U	A	A	A	A	A	A	U	U	X	A	U	A	1	2	0.50	4
MD522	-	-	-	-	-	U	A	1	0	X	U	X	X	A	X	X	U	X	1	8	0.13	2
MD543	-	-	-	-	-	-	-	-	-	U	U	X	U	U	2	U	U	U	2	2	1.00	1
MD569	-	-	-	-	-	-	-	-	-	-	-	U	X	U	3	X	U	0	3	4	0.75	2
MD570	-	-	-	-	-	-	-	-	-	-	U	1	1	0	1	0	0	U	3	6	0.50	2
MD571	-	-	-	-	-	-	-	-	-	-	2	U	X	U	X	U	U	U	2	3	0.67	2
MD572	-	-	-	-	-	-	-	-	-	-	U	A	X	U	U	U	U	A	0	1	0.00	4
NEW12	-	-	-	-	-	-	-	-	-	-	-	-	-	U	2	2	U	U	4	2	2.00	1
NEW035	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	U	0	0	0.00	3
TOTALS																						
28	0	4	5	2	13	0	6	6	0	4	2	5	10	3	26	12	8	0	106	134	0.79	

UKIAH																					
DFGID	Survey Years																	Total Production (minimum)	Years Data	Mean Annual Production (minimum)	Productivity Level
	90	91	92	93	94	95	96	97	98	99	00	01	02	03	04	05	06	07			
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00	
TOTALS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00	

## K.2 Protection levels

Table K-2 shows the protection levels for each known spotted owl territory at the start of the HCP/NCCP. The table is in alphabetical order by inventory block; within inventory block the territories are in numerical order.

**Table K-2 Owl Territories by MRC Inventory Block**

Owl Territories by MRC Inventory Block			
DFGID	Mean Annual Production	Productivity Level	Protection Level
<b>ALBION</b>			
MD063	0.29	4A	Moderate
MD064	0.75	2	Moderate
MD065	0.75	2	Moderate
MD129	0.92	1	High
MD168	0.92	1	High
MD170	0.25	5	Moderate
MD236	1.50	1	High
MD241	0.67	4A	Moderate
MD286	1.00	1	High
MD295	0.78	2	Moderate
MD299	0.00	3	Limited
MD321	1.40	4A	Moderate
MD369	0.09	2	Moderate
MD439	0.80	2	Moderate
MD497	0.00	3	Limited
MD544	0.00	4B	Limited
MD562	0.00	3	Limited
MD563	0.25	2	Moderate
MD577	0.00	4B	Limited
MD595	0.00	3	Limited
<b>BIG RIVER</b>			
MD060	0.00	5	Moderate
MD062	1.56	4A	Moderate
MD067	0.62	2	Moderate
MD068	0.63	2	Moderate
MD069	0.77	2	Moderate
MD070	0.13	2	Moderate
MD071	0.40	2	Moderate
MD072	0.50	2	Moderate
MD076	0.42	2	Moderate
MD079	0.45	2	Moderate

Owl Territories by MRC Inventory Block			
DFGID	Mean Annual Production	Productivity Level	Protection Level
MD080	0.22	2	Moderate
MD239	0.71	5	Moderate
MD301	0.45	2	Moderate
MD358	1.17	1	High
MD438	0.56	2	Moderate
MD477	0.00	4B	Limited
MD490	0.00	3	Limited
<b>GARCIA</b>			
MD102	0.20	4A	Moderate
MD130	0.67	2	Moderate
MD207	0.00	5	Moderate
MD208	0.00	4B	Limited
MD213	0.67	2	Moderate
MD214	0.00	5	Moderate
MD383	0.60	2	Moderate
MD386	0.00	5	Moderate
MD447	0.00	3	Limited
MD512	0.00	3	Limited
MD542	1.25	5	Moderate
MD573	0.60	5	Moderate
MD593	2.00	5	Moderate
NEW017	0.00	3	Limited
<b>NAVARRO EAST</b>			
MD025	0.44	2	Moderate
MD045	0.00	3	Limited
MD047	0.80	2	Moderate
MD077	0.50	2	Moderate
MD078	0.53	2	Moderate
MD103	0.45	2	Moderate
MD138	0.42	2	Moderate
MD160	0.86	1	High
MD161	0.17	5	Moderate
MD173	0.00	3	Limited
MD441	0.71	2	Moderate
MD445	0.75	2	Moderate
MD455	0.00	5	Moderate
MD511	0.00	3	Limited



Owl Territories by MRC Inventory Block			
DFGID	Mean Annual Production	Productivity Level	Protection Level
MD545	0.00	4A	Moderate
MD565	0.00	4A	Moderate
MD566	0.00	3	Limited
NEW015	0.75	2	Moderate
NEW025	0.00	3	Limited
NEW026	0.00	3	Limited
NEW029	0.00	4A	Moderate
NAVARRO WEST			
MD022	0.71	2	Moderate
MD023	0.81	1	Moderate
MD024	0.25	2	Moderate
MD053	0.82	1	High
MD066	1.23	1	High
MD125	1.27	1	High
MD126	0.33	2	Moderate
MD127	1.11	1	High
MD141	0.00	5	Moderate
MD178	1.00	1	High
MD222	0.00	5	Moderate
MD442	1.10	1	High
MD443	0.38	2	Moderate
MD444	0.88	1	High
MD489	1.00	1	High
MD518	0.89	1	High
MD521	0.00	5	Moderate
MD534	0.67	2	Moderate
MD549	0.50	2	Moderate
MD552	0.50	2	Moderate
MD575	1.00	1	High
NEW002	0.00	3	Limited
NEW030	0.00	3	Limited
NEW031	0.00	3	Limited
Noyo			
MD104	0.29	2	Moderate
MD120	0.00	3	Limited
MD121	0.86	1	High
MD122	1.00	4A	Moderate

Owl Territories by MRC Inventory Block			
DFGID	Mean Annual Production	Productivity Level	Protection Level
MD123	0.25	2	Moderate
MD176	0.63	2	Moderate
MD305	0.40	2	Moderate
MD375	0.67	2	Moderate
MD415	0.29	2	Moderate
MD437	0.29	2	Moderate
MD466	0.00	3	Limited
MD488	0.00	5	Moderate
MD508	0.00	5	Moderate
MD574	0.57	5	Moderate
MD578	0.67	2	Moderate
NEW020	0.00	3	Limited
<b>ROCKPORT</b>			
MD098	0.67	4A	Moderate
MD107	0.30	2	Moderate
MD108	0.60	2	Moderate
MD109	0.80	2	Moderate
MD134	0.64	2	Moderate
MD144	0.25	5	Moderate
MD169	0.22	2	Moderate
MD227	1.00	4A	Moderate
MD296	0.00	4B	Limited
MD297	0.00	4A	Moderate
MD381	0.67	2	Moderate
MD428	0.50	2	Moderate
MD429	0.20	2	Moderate
MD431	0.67	2	Moderate
MD432	0.00	3	Limited
MD433	0.00	5	Moderate
MD434	0.14	2	Moderate
MD435	0.00	3	Limited
MD436	0.25	2	Moderate
MD481	0.50	2	Moderate
MD513	0.40	2	Moderate
MD514	0.00	3	Limited
MD576	0.00	3	Limited
NEW023	0.00	3	Limited

Owl Territories by MRC Inventory Block			
DFGID	Mean Annual Production	Productivity Level	Protection Level
NEW024	0.00	3	Limited
NEW028	0.00	3	Limited
NEW033	0.00	4B	Limited
<b>SOUTH COAST</b>			
MD089	0.33	2	Moderate
MD090	0.10	2	Moderate
MD143	1.20	1	High
MD162	0.50	2	Moderate
MD182	0.80	2	Moderate
MD183	1.00	1	High
MD199	1.22	5	Moderate
MD200	1.67	1	High
MD201	0.50	2	Moderate
MD220	1.60	1	High
MD221	1.00	4A	Moderate
MD260	0.00	3	Limited
MD261	0.88	1	High
MD288	0.86	5	Moderate
MD289	1.00	1	High
MD382	2.00	1	High
MD384	0.50	4A	Moderate
MD385	0.29	2	Moderate
MD387	1.17	1	High
MD396	0.50	4A	Moderate
MD522	0.13	2	Moderate
MD543	1.00	1	High
MD569	0.75	2	Moderate
MD570	0.50	2	Moderate
MD571	0.67	2	Moderate
MD572	0.00	4B	Limited
NEW012	2.00	1	High
NEW035	0.00	3	Limited

## K.3 Nest site report

### K.3.1 Introduction

In the literature, nesting habitat for northern spotted owls is associated with late seral and old growth forests (LaHaye and Gutiérrez 1999, USFWS 1994b); multi-tiered structure (LaHaye and

Gutiérrez 1999, Pious and Ambrose 1994); greater tree basal area (LaHaye and Gutiérrez 1999, Thome et al. 1999); and canopy cover (USFWS 1994b, Pious and Ambrose 1994). Evidence from the coastal redwood zone of northwestern California suggests that northern spotted owls exist in relatively high densities and nest in substantially younger stands on managed timberlands than has been commonly reported throughout their range (Diller and Thome 1999, Thome et al. 1999). This may be due to fast regeneration of redwood forests; cool coastal climate; and smaller home ranges with high amounts of edge. The prevalence of woodrats as primary prey species may also be a factor (Thome et al. 1999, Zabel et al. 1995, Folliard et al. 2000).

Studies examining nest site selection have found that nest tree diameter is often larger and canopy height greater than random trees (Buchanan et al. 1993, Thome et al. 1999, Pious and Ambrose 1994). Moreover, nest structures in the form of deformities, debris accumulations, or structures constructed by other mammal or avian species are common within nest sites (Buchanan et al. 1993).

There is no extensive information on northern spotted owl nest sites or nest stands for the plan area. This, in itself, limits the development of sound management strategies. MRC initiated a study to compare nest site use with nest site availability; describe important nest site characteristics unique to this part of the redwood region; and empirically define nesting habitat. All of this information impacts our conservation measures for northern spotted owls. In this appendix, we have provided preliminary results for 79 northern spotted owl nest sites and random sites. We chose only to use data through 2003 to extrapolate and validate our nest site habitat typing detailed in Chapter 10 (see 10.3.1.8). This is also the study that we will be use in validation monitoring to assess the definition of nesting/roosting habitat (see 13.9.1.3). Because our project is ongoing, we have only included a small subset of the collected variables.

### **K.3.2 MRC methods for nest site evaluation**

Between 2001 and 2005, MRC measured 79 nest trees of northern spotted from different territories. We collected data on tree species; dbh; height; height-to-crown base (htcb); age; condition; nest type; nest height; nest aspect; percent slope; slope aspect, and canopy cover. In addition, we measured nest sites centered on the nest tree using a nested plot design. We collected specific metrics in 0.12, 0.25, and 0.50 acre plots (see Figure K-1). This ensured that we would have an increased chance of detecting metrics too large or infrequent in small plots. To allow for comparison with other potential nest tree plots which MRC did not use, we measured 79 random plots situated at a random azimuth (see Figure K-2).

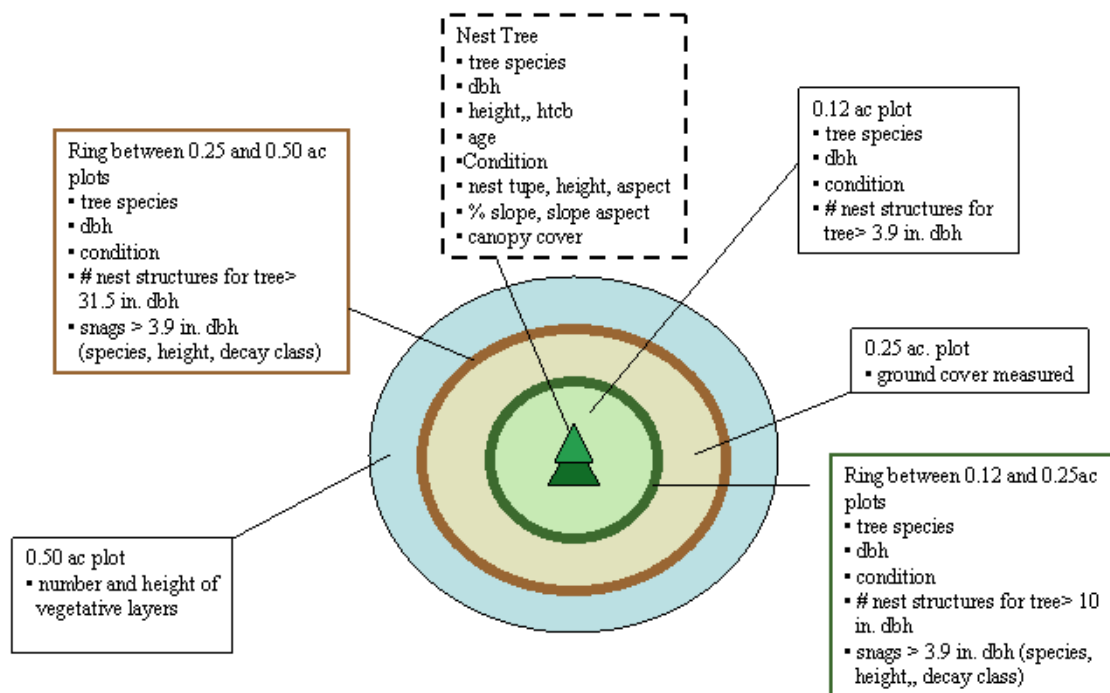


Figure K-1 Nest Plot Design

Table K-3 shows which trees MRC measured in the plots.

Table K-3 Measuring Height and HTCB of Trees

Acre Plot	Trees Measured	DBH
0.12	Every tree	> 3.9 in.
0.12 – 0.25	Every other tree	> 10 in.
0.25 – 0.50	Every other tree	> 32 in.

The height was measured for all snags as well. Canopy cover was measured with a spherical densiometer. Four densiometer measurements (one in each cardinal direction) were taken at the edge of the 0.12 acre plot and at 6.6 ft away from the nest/random tree. Ground cover was measured using the line-intercept method where two transects (north/south and east/west) were situated along the diameter of the 0.25 acre plot. Basal area was measured using a 20-factor prism on the north edge of the 0.12 acre plot.

A random plot was also located within suitable habitat for nesting northern spotted owls; the plot was centered on a tree that could hypothetically contain a northern spotted owl nest (i.e.,  $\geq 11$  in. dbh). MRC selected a random tree at a fixed distance of 328 ft from the edge of the 0.50 acre nest tree plot (see Figure K-2). Choosing this distance ensured that trees in the nest plot did not have the capacity to influence measurements in the random plot. To determine an azimuth to travel to the selected tree, we use a random number generator, selecting numbers from 0-360. In Figure K-2, the dotted lines at 328 ft from the edge of the nest plot indicate other random azimuths that might have been chosen. In other words, the azimuths were not always due west. MRC centered a new nest plot around this random tree and collected the same data as for the nest tree plot.

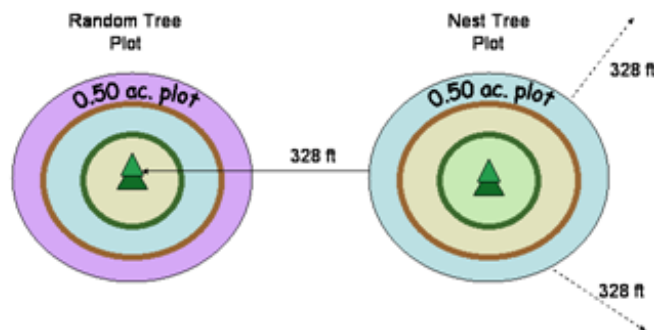


Figure K-2 Random Plot

### K.3.3 Comparison of nest tree and random tree

#### K.3.3.1 Nest tree

MRC located nests in 5 species of trees: redwood ( $n = 59$ ), tanoak ( $n = 9$ ), Douglas-fir ( $n = 8$ ), grand fir ( $n = 2$ ), and red alder ( $n = 1$ ). This is consistent with previous findings in this area (Pious and Ambrose 1994) but contrary to LaHaye and Gutiérrez (1999) who commonly found nests in redwood and Douglas-fir. Nest types were primarily platforms—debris accumulations ( $n = 35$ ), or stick nests ( $n = 24$ ). However, some nests were also in cavities ( $n = 14$ ), while others were unidentifiable ( $n = 6$ ). We did not find any nests in snags. Dbh was the only characteristic that differed in comparisons between nest and random trees ( $P < 0.001$ ). The larger dbh nest trees may provide deformities and larger nest structures required by northern spotted owls (Pious and Ambrose 1994, LaHaye and Gutiérrez 1999, Irwin et al. 2000). Table K-4 shows a comparison of nest and random tree characteristics for 2001 thru 2005. Since our data did not display a normal distribution, we used the Mann-Whitney U-Test for statistical comparison.

Table K-4 Nest and Random Tree Characteristics

Measurements of 79 Nest Trees on MRC Land from 2001-2005		
Parameter	Nest Mean (SE)	Random Mean (SE)
Tree dbh (in.)	40.13 (2.81) <sup>a</sup>	22.41 (1.51)
Height (ft)	108.08 (5.67)	92.87 (4.72)
Height-to-live-crown-base (ft)	58.54 (3.08)	47.84 (4.28)
Slope (%)	53.23 (3.91)	46.72 (2.35)
Slope aspect (0-360 <sup>0</sup> )	178.90 (12.0)	193.9 (11.90)
Canopy cover (%)	90.84 (0.67)	88.71 (1.72)
Nest height (ft)	63.04 (2.90)	NA
Nest aspect (0-360 <sup>0</sup> )	183.6 (12.60)	NA

#### TABLE NOTES

<sup>a</sup> Significantly different from random using nonparametric Mann-Whitney U-Test ( $P < 0.001$ )

### K.3.3.2 Nest site

Consistent with other studies (LaHaye and Gutiérrez 1999, Thome et al. 1999), basal area ( $\text{ft}^2/0.12$  acre plot) was greater in nest sites than random sites ( $P < 0.005$ ). We also found greater redwood basal area ( $P < 0.10$ ), conifer basal area ( $P < 0.05$ ), and snag basal area ( $P < 0.10$ ) in our nest sites compared to random sites. Some researchers have found differences in canopy closure and number of snags between nest and random sites (Pious and Ambrose 1994, LaHaye and Gutiérrez 1999, USFWS 1994b). MRC did not ( $P > 0.05$ ), perhaps because spherical densiometers are insensitive to changes in canopy, especially when canopy is relatively dense (Cook et al. 1995). While there may have been a similar number of snags between nest and random sites, the snags in our nest sites were generally larger, leading to a higher basal area of snags in the nest site. Table K-4 shows a comparison of nest and random plot characteristics in a 0.12 ac plot for 79 spotted owl nest and random sites between 2001 and 2005.

**Table K-5 Nest and Random Plot Characteristics**

Parameter	Nest Mean (SE)	Random Mean (SE)
Total basal area - $\text{ft}^2$ / plot	32.65 (2.40) <sup>a</sup>	22.90 (1.67)
Redwood basal area - $\text{ft}^2$ / plot	19.58 (2.57) <sup>b</sup>	11.93 (1.41)
Douglas-fir basal area - $\text{ft}^2$ / plot	5.87 (0.79)	4.81 (0.849)
Tanoak basal area - $\text{ft}^2$ / plot	5.30 (0.58)	4.37 (0.57)
Conifer basal area - $\text{ft}^2$ / plot	26.36 (2.67) <sup>c</sup>	17.05 (1.77)
Hardwood basal area - $\text{ft}^2$ / plot	6.29 (0.61)	5.85 (0.62)
Snag basal area - $\text{ft}^2$ / plot	2.13 (0.62) <sup>b</sup>	0.70 (0.13)
Number of snags	2.38 (0.32)	1.70 (0.28)
Number of nest structures	0.22 (0.06)	0.11 (0.04)
Number of redwood trees	9.62 (1.07)	8.37 (0.77)
Number of Douglas-fir trees	3.82 (0.59)	3.28 (0.51)
Number of tanoak trees	13.00 (1.41)	9.19 (1.05)
Number of conifer trees	14.29 (1.18)	12.03 (0.97)
Number of hardwood trees	14.42 (1.41)	10.96 (1.08)

#### TABLE NOTES

<sup>a/b/c</sup> Significantly different from random using nonparametric Mann-Whitney U-Test:

a = ( $P < 0.005$ )

b = ( $P < 0.10$ )

c = ( $P < 0.05$ )

## K.4 Regional analysis of northern spotted owls

### *Impacts of reduced owl territories*

MRC completed this regional analysis to ensure that a potential 30% reduction in northern spotted owl territories would not result in non-interacting and isolated northern spotted owl territories. Recent research indicates that banded male northern spotted owls will disperse a median distance of 9 miles (14.6 km) and banded female northern spotted owls will disperse a median distance of 15.2 miles (24.5 km) (Forsman et al. 2002). In order to follow a precautionary principle, we chose to use 9 miles as a cut-off threshold to assess if territories became excessively **isolated**.

We conducted our analysis using all known owl territories in the 2007 CDFG Northern Spotted Owl Database for Mendocino County. While the results are a quantitative measure of how well the northern spotted owl population is distributed, they also illustrate the impact of reducing spotted owl territories by 30%. To simulate such a reduction in territories, we removed 30% of known northern spotted owl territories (n = 220) from our analysis.

Since we do not have pertinent reproductive information on spotted owls outside MRC forest lands, we used a random number generator for territory removal. To better understand the range of possible outcomes, we completed 50 iterations of random territory removals, a figure that is likely to account for all possible incidental take scenarios. The nearest-neighbor distance was obtained for each territory during iteration. After 50 iterations, we selected the minimum and maximum nearest-neighbor distances. Through this data, we could determine which territories were most isolated, and, if necessary, select an alternate conservation scheme. We could also examine the overall effect in distribution of northern spotted owls with a 30% reduction in the number of existing territories.

#### *Results of regional analysis*

The mean maximum distance to the nearest owl territory was 6.33 miles. Of the 50 iterations, 95% found that spotted owl territories were no more than 7.78 miles from their nearest neighbor. We concluded that it is unlikely that potentially taking 30% of northern spotted owls from the region would cause their populations in Mendocino County to become further isolated.

**Table K-6 Nearest Neighbor Analysis**

Calculations	Mendocino County	
	Nearest Neighbor Distance (miles)	
	Minimum	Maximum
Mean	0.13	6.33
Standard error	0.02	0.08
Range	0.03 – 0.46	4.38 – 7.78

## **K.5 Protocols**

### **K.5.1 Surveying**

#### **K.5.1.1 Source and purpose of MRC protocol**

MRC developed the following protocol based on the USFWS protocol from 1992, including some widely-accepted changes used by the wildlife agencies. Using the latest scientific data on owls and site-specific knowledge, we modified the protocol to better fit our land and harvesting methods. When implemented, the MRC protocol should

1. Provide adequate coverage and assessment of an area for the presence of spotted owls.
2. Ensure a high probability of locating resident spotted owls and identifying owl territories that may be affected by a proposed management activity, such as timber harvesting, modification of habitat, or noise disturbance.
3. Minimize the potential for unauthorized incidental take.
4. Determine nesting and reproductive success (number of fledged young) of northern spotted owl territories within covered lands.
5. Identify areas with barred owls and other potential avian predators or competitors.



USFWS released a new owl protocol in 2010 in response to increased barred owl detections, recent data analyses, professional opinions of researchers and managers, and concerns about the effectiveness of owl surveys.

The protocol for our HCP/NCCP derives from many meetings and discussions with USFWS and CDFG as well as from the 1992 USFWS-endorsed spotted owl survey protocol. MRC has a long survey history for the plan area dating back to 1990; this gives us abundant information about our spotted owl population. In addition, we will monitor, as part of HCP/NCCP implementation, all productive owl territories in the plan area on a 5-year rotating basis. In order to address the major concerns of the 2010 USFWS protocol, we have updated our own protocol to include provisions for locating barred owls and determining the possible reasons for the abandonment of spotted owl territories. Moreover, if USFWS changes its spotted owl protocol in the future, MRC and the wildlife agencies will reach agreement on any subsequent changes required in our HCP/NCCP protocol. The intent of a change in protocol would be to maintain at least as high a probability of detection as the 2010 USFWS protocol.

MRC will adapt this protocol over time to maintain high detectability levels of northern spotted owls. The wildlife agencies must approve all changes.

#### K.5.1.2 Activities requiring surveys

Table K-6 indicates all covered activities<sup>1</sup> that require surveys for spotted owl territories. The subsection immediately following the table clarifies the assessment area for each required survey.

**Table K-7 Covered Activities Requiring NSO Surveys**

Covered Activities Requiring NSO Surveys		
Covered Activity	Survey?	Comments
<ul style="list-style-type: none"> <li>Commercial harvesting operations</li> </ul>	Generally	Needs survey unless there is no suitable NSO habitat within 0.7 miles of boundaries, inclusive of the harvesting operation, and no known activity center within ½ mile.
<ul style="list-style-type: none"> <li>Vegetation management               <ul style="list-style-type: none"> <li>Planting</li> <li>Manual brush removal</li> </ul> </li> </ul>	No Generally not	Needs survey only for operations using mechanized equipment; see requirements below.
<ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li>Chainsaw work</li> </ul> </li> </ul>	Generally not	<ul style="list-style-type: none"> <li>Needs survey only if work will result in reduction of NSO habitat during non-breeding season.</li> <li>Needs survey during breeding season only if conducted within 0.5 mile of a known activity center and off a mainline road.</li> <li>No requirement for a survey if simply using a chainsaw to clear roads for access.</li> </ul>
<ul style="list-style-type: none"> <li>Heavy equipment</li> </ul>	Generally not	Needs survey only if completed during breeding

<sup>1</sup> The wildlife agencies do not require surveys for activities conducted on roads mapped as mainline haul routes in Appendix B, *HCP/NCCP Atlas*, MAPS 14A-C.

Covered Activities Requiring NSO Surveys		
Covered Activity	Survey?	Comments
<ul style="list-style-type: none"> <li>Prescribed burning</li> </ul>	Generally not	season within 0.5 miles of known NSO activity centers and off a mainline road. Needs survey only if work will result in reduction of NSO habitat or burning during breeding season.
<ul style="list-style-type: none"> <li>Slash pile burning</li> </ul>	No	
<ul style="list-style-type: none"> <li>Roads and landings</li> </ul>	Generally	Needs survey unless roads are mainline haul routes and landings are directly on mainline roads.
<ul style="list-style-type: none"> <li>Rock pits, quarries, surface mining</li> </ul>	Yes	Needs survey unless rock pits, quarries, or surface mining occurs on mainline roads
<ul style="list-style-type: none"> <li>Data collection for monitoring</li> </ul>	No	
<ul style="list-style-type: none"> <li>Habitat improvement/creation</li> </ul>	Yes	
<ul style="list-style-type: none"> <li>Grandfathered THPs</li> </ul>	Yes	

#### K.5.1.3 Extent of survey area

- If disturbance only<sup>2</sup> is proposed
  - The survey will extend to 0.5 miles beyond a project boundary for a PTHP.
  - The survey will extend to 1000 ft beyond a potential disturbance for a non-PTHP project. MRC staff will ensure that no high or moderately protected territories have been located within this buffer area within the past 3 years.
- If habitat reduction is proposed, the survey area will extend to 0.7 miles beyond the project area.
- If blasting is proposed, the survey will extend 1 mile beyond the blast site.

#### K.5.1.4 Accuracy of 1-year and 2-year surveys

In preparing its 1992 protocol for northern spotted owls, USFWS analyzed survey data to determine the number of visits needed to detect territorial owls or to conclude that a lack of owl response reflected an absence of spotted owls. Their data analysis provided the basis for the number of visits that MRC requires for our 2-year survey (i.e., 3 visits per year) and 1-year survey (i.e., 6 visits per year). A complete survey covers a survey area to the required number of visits or documents activity centers of all spotted owl territories that account for all spotted owl habitat in the project impact area. Surveys over 2 years provide more confidence that the results reflect presence or absence in the current and subsequent year because owls sometimes occupy territories intermittently. MRC staff may actually complete such surveys before the end of 2 years if they obtain a response and confirm the status of the owl(s).

#### K.5.1.5 2-year survey

If a 2-year survey is completed without owl responses, the project may continue until the next breeding season. If MRC plans to restart the project beyond that point, we must complete 3 surveys in March that yield no owl response. This assumes that all high and moderate protection territories within 0.7 miles of a PTHP are located in the current year of harvest operations.

<sup>2</sup> A “disturbance-only PTHP” is one that does not propose any reduction in habitat.

EXAMPLE OF 2-YEAR SURVEY	
Year 1 (March - July)	3 visits with no response.
Year 2 (March - July)	3 visits with no response.
Year 3	A minimum of 3 surveys with no response prior to commencing operations.
Year 4	A minimum of 3 surveys with no response prior to commencing operations.
Year 5	A minimum of 3 surveys with no response prior to commencing operations.

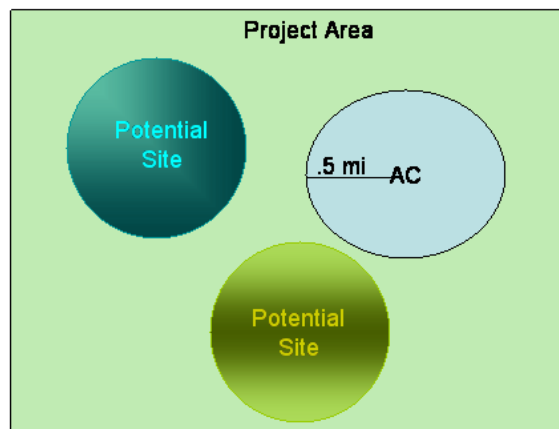
#### **K.5.1.6 1-Year survey**

If a 1-year survey is completed and no responses are obtained, harvest may occur before the start of the next breeding season. If harvest is not completed by the start of that breeding season, another survey with a minimum of 3 visits needs to be conducted prior to harvest in Year 2. MRC will continue conducting 3 surveys a year until the harvest operations are complete. This assumes that all territories with high and moderate protection within 0.7 miles of a PTHP area are located in the current year of harvest operations.

EXAMPLE OF 1-YEAR SURVEY	
Year 1 (March - July)	6 visits with no responses.
Year 2	A minimum of 3 surveys with no response prior to commencing operations.
Year 3	A minimum of 3 surveys with no response prior to commencing operations.
Year 4	A minimum of 3 surveys with no response prior to commencing operations.
Year 5	A minimum of 3 surveys with no response prior to commencing operations.

#### **K.5.1.7 Locating nest site or activity center**

If a nest site or activity center is located during a survey and the project area is large enough to possibly support more than one site (i.e., there is at least a .5 mi. radius from the located owl to another site), the remaining potential habitat should be surveyed (Figure K-3). Half a mile is a commonly accepted distance for owl nests. Though our minimum inter-territory distance varies from this number, we believe, on average, territorial owl activity occurs a half mile or more from other owl territories. Minimum inter-territory distance does not represent the average distance between territories, only the minimum distance; it is not a good measure to address typical conditions.



**Figure K-3 Potential Sites in Project Area**

#### **K.5.1.8 Area of surveys**

MRC will inventory all potential suitable habitat for northern spotted owls in a harvest impact area using current habitat typing. If potentially suitable habitat is located, MRC will conduct surveys. If no potentially suitable habitat is located within the harvest boundary or 0.7 mi. away, no surveys will be required. All areas of suitable habitat within the harvest boundary will be surveyed unless spotted owl territories have been located within 0.5 miles or survey work has adequately covered the area in the current year.

#### **K.5.1.9 Timing of surveys**

MRC will conduct surveys based on the timing of harvest operations.

##### **K.5.1.9.1 Ongoing operations**

Operations initiated prior to February 1 may continue past February 1 only if

- 1-year or 2-year protocol surveys have been completed in the prior year(s).
- 1 survey is completed in February, prior to harvest.
- Operations were ongoing between March 25 and March 31, excluding 3 days or less when operations halted due to weather.
- Activity centers are located for all active territories within 0.5 mile (or 1 mile if rock-blasting) of the harvest boundary.

Operations may continue past March 1 only if

- 1-year or 2-year protocol surveys have been completed in the prior year(s).
- One survey is completed in both February and March, concurrent, if necessary, with timber operations.
- Activity centers are located for all active territories within 0.5 mile (or 1 mile if rock-blasting) of the harvest boundary or activity centers saturate all suitable habitat for spotted owl territories within that distance.

##### **K.5.1.9.2 Full operations**

Start-up operations can be initiated between March 1 and May 15 only if

- 1-year or 2-year protocol surveys have been completed in the prior year(s).

- 3 surveys prior to operation start-up within 0.5 miles of the PTHP boundary have been completed.
- Activity centers (a) have been located and saturate all suitable habitat for all spotted owl territories within 0.5 miles (1 mile if rock-blasting) of the harvest area and (b) the operations adhere to disturbance limitations; or activity centers are located for all active territories within 0.5 mile (or 1 mile if rock-blasting) of the harvest boundary

Start-up operations can be initiated after May 15<sup>th</sup> only if

- 1-year or 2-year protocol surveys have been completed including surveys from the current year.
- Activity centers are located or deemed unoccupied for all active territories within 0.5 miles (1 mile if rock-blasting) and harvest area are located or deemed unoccupied.

**NOTE**

In this case, activity centers have saturated all suitable habitat within 0.5 miles of the harvest area and the operations adhere to disturbance limitations.

OR

- The harvest area and area within 0.5 miles (1 mile if rock-blasting) of the PTHP (a) is saturated with owl activity centers (i.e., activity center + ½ mile buffer covers the entire harvest area and the area within 0.5 miles of the harvest boundary) and (b) the operations adhere to disturbance limitations.

#### **K.5.1.9.3 Determining abandoned status of an historically occupied site**

If after 3 consecutive years of surveying to protocol MRC has obtained no responses (during a combination of daytime and/or nocturnal surveys) at a historical site, we will consider the site abandoned, barring other evidence to the contrary. The following conditions will apply:

- If a territory becomes unoccupied and MRC declares the territory abandoned with concurrence of the wildlife agencies, the site will be available for harvest.
- If an abandoned site becomes re-occupied, MRC will base productivity calculations only on reproductive success of the current occupants.
- If the site becomes re-occupied by spotted owls which MRC can visually identify through leg bands as the prior occupants, we will include the prior reproductive calculations in our productivity assessment.

#### **K.5.1.9.4 New territories**

MRC considers any new territory a Level-3 territory until 3 years of data are collected. We will apply limited protection to this activity center unless we are not meeting our numeric objectives for Level-1 and Level-2 territories. In that case, we will provide moderate protection for new spotted owl territories.

#### **K.5.1.9.5 Deviations from standard protocol**

There are many situations where deviations from this protocol are warranted. Any information on owl presence within or adjacent to a proposed project area is important, even if it does not meet the guidelines described here. However, if information for a proposed activity is acquired through less intensive surveys, MRC will document why the recommended protocol was not followed and consult with the wildlife agencies prior to initiation of operations to assess impacts in a “worst case” analysis.

## **K.5.2 Protocol for night-calling survey**

### **K.5.2.1 Habitat to be surveyed**

For survey purposes, northern spotted owl habitat is nesting/roosting or foraging habitat. At a minimum, MRC must survey all nesting/roosting and foraging habitat.

### **K.5.2.2 Coordination of Information**

MRC will avoid common mistakes, such as overlapping visits by more than one survey group, through coordinated planning. When possible, we will also inform adjacent landowners of all surveys near their property. Such surveys could affect their own management and logging operations. Moreover, neighboring landowners may provide information on off-property owls and cooperate in joint surveys. MRC will submit an annual report on all survey and PTHP activity completed to the wildlife agencies.

### **K.5.2.3 Survey period**

Surveys of proposed management activity areas must take place between March 1 and August 1, unless proposed operations initiate prior to February 1. For areas where there is adequate biological information that birds are defending their established territories prior to March 1, MRC may use earlier dates as a starting time. Positive responses after August 1 are still valid, but negative results after this date do not count as required visits for completing a survey. Positive responses obtained after August 1 also indicate that the area in question should be surveyed the following year.

#### **K.5.2.3.1 Establishing the survey area**

- Develop transects or calling stations to cover all spotted owl habitat within the delineated survey area, including locations detailed in the sub-section, *Extent of survey area*. Surveys are not required for mainline haul routes.
- Establish calling stations and survey routes to achieve complete coverage of the area, preferably from more than 1 calling station. Calling stations should be spaced approximately 1/4 to 1/2 mile apart, depending on topography and background noise levels. Take advantage of prominent points within the survey area when establishing calling stations. If necessary, to ensure complete coverage of the area, supplement the prominent points with intermediate calling stations. Where known spotted owl activity centers exist within the survey area, survey areas may be adjusted to exclude habitat that would be within earshot of the activity center. However, consider the need to survey the known activity center for current status. The intent is to obtain complete coverage of the area where owls will be able to hear the surveyor and the surveyor will be able to hear the owl.
- Record, for each visit, whether results are positive or negative, and include the following information:
  - County
  - Watershed
  - PTHP or Inventory Block
  - Survey type (point, cruise, or combination)
  - Surveyor(s) name
  - Survey date
  - Brief description of survey route
  - Survey start and finish time

- Total time of survey
  - Weather conditions (including estimated precipitation level, wind speed, and percent cloud cover)
  - Survey results, i.e., spotted owl detections, including time of response, sex, and age (if possible); type of response (i.e., audio, visual, or both); azimuth of response; estimated distance of response; behavior or vocalization type; For multiple or moving owls, list information and number each response or observation. This will allow more accurate determinations of management centers.
- Record all sightings of or responses by barred owls, great horned owls, northern goshawks, or any other raptor species. The presence of other raptors may affect spotted owl responses.
  - Map the following for each visit:
    - Route surveyed and stations called.
    - Spotted owl response or observation locations. For multiple or moving owls, map all response or observation locations and number to correspond with survey results. Again, this will assist in determining activity centers.
  - Map responses or observation locations of barred owl, great horned owl, and northern goshawk. If a barred owl is detected, make a reasonable effort to determine a daytime location and assess reproductive status. Continue to monitor the barred owl territory throughout the term of the HCP/NCCP.

#### **K.5.2.4 Survey methods**

There are 4 types of acceptable surveys: point calling, cruising or leapfrog surveys, daytime calling surveys, and territory monitoring (site visits). Point calling is the recommended method for nocturnal surveys; territory monitoring is the recommended method for daytime surveys at historic site centers or nocturnal detection locations (i.e., daytime follow-up visits).

##### **1. Point calling**

Set up a series of calling stations 1/4 to 1/2 mile apart along the road transects. When possible, pick prominent points which cover large areas. Spend at least 10 minutes at each station. If the topography lends itself to fewer, prominent calling stations, spend more time at each station. Be sure the entire survey area is adequately covered.

##### **2. Cruising or leapfrog surveys**

Walk the designated route calling and pausing at prominent points and at regular intervals throughout the area to conduct informal stations of 10-minute duration. If 2 people are involved, you may use a leapfrog method (Forsman 1983).

##### **3. Daytime calling surveys**

Set up a series of calling stations at least 600 ft apart along the road transects. When possible, pick prominent points which cover large areas. Spend at least 20 minutes at each station (section K.5.2.6).

##### **4. Territory monitoring (site visits)**

Walk a route through a historically occupied site during the daytime calling at regular intervals and pausing to search the area for sign of spotted owls (i.e., feathers, whitewash, nest structures, roosting birds, etc.). Once you locate the owls, note their location with a GPS unit and assess occupancy and reproductive status (section K.5.2.6.3). Spend a minimum of 90 minutes searching an historically occupied site if you are unable to detect a spotted owl.

#### **K.5.2.5 Survey instructions**

The following instructions apply to any of the methods described in section K.5.2.4:

- Elicit responses from northern spotted owls with voice calling or with a digital wildlife caller (recommended). Record the time you arrive at the station and begin calling. Continue this process for at least 10 minutes at each calling station.
- Use a digital wildlife caller to elicit a response, if surveys have detected a barred owl within 0.5 miles of the point location within the last 5 years. First, call spotted owls for 10 minutes, followed by 2.5 minutes of silence. If there is no response, call barred owls for 5 minutes, followed by 2.5 minutes of silence.
- Add an additional survey using the techniques discussed immediately above, if 3 surveys for a known historic territory result in no response.
- Add an additional survey if MRC, within the last 5 years, detects a barred owl within 0.5 miles of the point location and there has been no owl response during 4 surveys for a territory.
- Characterize behavioral observations. Make note of agitated calls, continuous responses, movement (toward you or away from you), or situations where there is only one owl response followed by quiet. Recording this type of information may assist with the identification of activity centers.
- Conduct night surveys between sunset and sunrise. Be sure not to call the same section of a survey route at the same time on each survey effort (i.e., vary the time you start and the section of the route from which you start).
- Do not survey under inclement weather conditions, such as high winds (> 10 mph), heavy rain, heavy fog, or high noise levels (e.g., stream noise, machinery, etc.) which would prevent you from hearing responses. If weather conditions or noise levels are in doubt, be conservative. Survey visits conducted under marginal conditions will reduce the quality of the overall survey effort. Negative results collected under inclement weather conditions may not be adequate for evaluating spotted owl presence or absence. When using an alternate survey point because of stream noise, note this on the survey sheet and re-locate the point in approximately the same survey area. Stream noise is generally a problem during surveys early in the breeding season from March through April.
- Resort to more than one visit, if necessary, to complete a survey. The objective of a complete visit is to conduct a thorough survey of the entire area in one field outing;



however, in some cases this may not be possible. A complete visit may be a combination of a day and a night field outing and, in addition, may include a daytime follow-up visit. If reasonable effort was made to cover the area in one outing, but this was not accomplished, then the remaining area should be surveyed in the following field effort. To reduce the chance of owls moving between portions of the survey area and, as a result, being missed, complete the visit on consecutive days as much as possible. The entire area should be covered within 7 days in order to be considered as one complete visit.

- Divide a large project area that cannot be surveyed in 7 days into smaller areas based on available habitat, topography, drainages, and other important factors. Survey areas need to be small enough to be completely surveyed within the specified time period.
- Count as 1 complete visit a night outing and daytime follow-up. If a surveyor goes out at night and does not get a response, a daytime follow-up would not be necessary. In this case, the night outing alone would be considered 1 complete visit. Whether or not owls are heard, the entire area needs to be surveyed to count as a complete visit.
- Space visits at least 5 days apart. For example, assume a visit ends on the 3<sup>rd</sup> of May. Using a proper 5-day spacing (May 4-8), the next possible visit date would be May 9<sup>th</sup>.
- Conduct at least 2 of the night visits per year before June 30 for a 2-year survey and at least 4 of the night visits before June 30 for a 1-year survey. During years when nesting occurs early,<sup>3</sup> 1 survey may occur after May 15 and before June 30; otherwise, the survey must occur during the month of June. Also, survey effort should be spread out over 5 months to avoid efforts concentrated in a short period of time, particularly at the beginning of the survey season. Exceptions to this timing may only occur when (a) operations begin prior to May 15 and (b) MRC has met either the 1-year or 2-year survey protocol.
- Adjust the survey period when there are season restrictions due to snow, landslides, mud, and bridge failures, etc., and provide documentation to explain the modifications.
- Conduct surveys during the day when there are no roads or foot trails to traverse at night or when there are other safety concerns. Provide documentation on the specific safety concerns.

#### **K.5.2.6 Daytime calling survey**

Permit daytime calling in areas that are not accessible with nocturnal surveys in order to reduce the chance of worker injury while hiking at night. Follow the point method, if possible, when using daytime surveys. Space call points no further than 600 ft apart, if using daytime surveys; owls do not respond from long distances during the day as they do at night. Conduct all daytime calling for at least 20 minutes. Increase, alternatively, inter-station distance to 0.25 mile when

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<sup>3</sup> MRC and the wildlife agencies will determine an early nesting year. We will request such a determination by May 1 of the calendar year and the wildlife agencies must reply by May 31<sup>st</sup> of that year.

conducting a cruise survey between points, but still spend at least 20 minutes surveying each station.

#### **K.5.2.6.1 Owls located during survey**

- Estimate the owl's original and final location. One method is to triangulate on the owl's call, taking compass bearings from 2-3 locations. Make sure compass bearings are taken in as short a time-frame as possible. Record on the survey form the method used to estimate the location.
- Record the location(s) of the owl, preferably on a map or photo attached to the survey form.
- Attempt to confirm the owl(s) location with a daytime follow-up. The intent of triangulation and mapping is to provide a means for verification of the location. Daytime locations are very important in determining more precise activity centers.
- Record a bird response. If no response is heard, proceed to the next calling station. Continue until the survey area is completely covered.
- Return to the same area during the day if a bird responds at night; return within 72 hours to verify status. If weather precludes a return visit, document this.
- Conduct an intensive search during a daytime follow-up to locate spotted owls (pairs or singles) within the general vicinity of the night response. Surveys may begin from roads closest to the night response area. However, if owls do not respond to road surveys, surveyors should conduct walking routes through the area. Surveyors should spend sufficient time within the stand to cover the area well. This may take several hours, depending on the terrain. Observers should watch for owls flying in without responding and for other evidence of occupancy, such as pellets, whitewash, and feathers. Pellets, whitewash, or feathers alone are not sufficient to document spotted owl presence or residency. Mobbing jays are also a potential indicator of owl presence. The follow-up should be completed within 72 hours after presence was detected, as owls are more apt to be located near the previous night's location. A daytime follow-up is only the second part of a complete visit.
- Determine status if a response occurs during daylight hours and there is sufficient time to do so. Use conservative judgment and hoot only as much as needed to determine status. Do not hoot any more than is necessary. By stimulating the owls to move around, you increase their risk of predation. Excessive calling near a nest site may cause harassment by bringing the female off the nest. Excessive use of the agitated call in high owl density areas (e.g., California coastal areas) may also confound survey results by eliciting responses from owls representing multiple territories.
- Complete the survey route to determine pair status once a bird responds at night. To avoid *leading* a spotted owl through calling, go to the other end of the survey route and complete the rest of the survey once an owl responds. If that is not practical, survey only the remaining stations that are beyond the earshot of the responding bird. Beyond earshot is generally over a ridge or at least a 1/2 to 3/4 mile straight-line

distance from the owl. Completing the route will provide an opportunity to detect any other owls.

- Continue to call for the duration of the station visit even after other species respond unless the surveyor believes that this will increase the potential for predation, for example, by great horned owls or northern goshawks.

#### **K.5.2.6.2 Additional visits**

Additional visits may be required if resident status cannot be determined during surveys. These visits should be in the general area of the response (i.e., a 0.5-mile radius around the site). If resident status is determined at any point during the additional visits, no more visits to that particular site are required for the year. The same standards (timing, intervals, weather condition limitations, etc.) apply to additional visits.

In a 2-year survey, MRC will conduct additional visits the same year as the response:

- If the last response occurs on the 1<sup>st</sup> visit, MRC will conduct 1 additional visit.
- If the last response occurs on the 2<sup>nd</sup> visit, MRC will conduct 2 additional visits.
- If the last response occurs on the 3<sup>rd</sup> visit, MRC will conduct 3 additional visits.

In a 1-year survey, MRC will conduct additional visits the same year as the response:

- If the last response occurs on the 4<sup>th</sup> visit, MRC will conduct 1 additional visit.
- If the last response occurs on the 5<sup>th</sup> visit, MRC will conduct 2 additional visits.
- If the last response occurs on the 6<sup>th</sup> visit, MRC will conduct 3 additional visits.

If MRC cannot obtain 3 responses even after additional visits, we will not classify the owl as a resident single.

#### **K.5.2.6.3 Status**

MRC will establish pair status if

1. A male and female are heard or observed (either initially or through their movement) in proximity (< 1/4 mile apart) to each other on the same visit.
2. The male takes a mouse to the female.
3. The female is observed on a nest.
4. One or both adults are observed with young. Young alone do not define a pair because young barred owls look like young spotted owls until late in the summer.

When unidentified calls are heard in the vicinity of a known spotted owl, the surveyor should not assume species identification of the unknown owl. Daytime follow-ups should be used to clarify these situations.

MRC will establish resident single status if

1. There is presence or response of a single owl within the same general area on 3 or more occasions within a breeding season, with no response by an owl of the opposite sex after a complete survey.
2. There are multiple responses over several years (e.g., 2 responses in Year-1 and 1 response in Year-2, from the same general area).

A resident single may represent a succession of single owls within the same general area in single or multiple years. Determining if the responses occur within the same general area should be based on topography and the location of any other owls known for the surrounding area. This should be determined by the wildlife biologist for the particular area. Radio-telemetry and banding data can also be used to aid in determining status of singles.

MRC will establish status unknown if there is a response of a male and/or female which does not meet any of the above category definitions.

### **K.5.3 Protocol for determining reproductive status**

#### **K.5.3.1 Reproduction surveys**

Determining reproductive success is not required to avoid "take," if breeding season restrictions are applied to all harvest activity in order to protect owl reproduction during any given year. Restrictions may be dropped if, according to the protocol, surveys reveal that owls are non-nesting or that no young were produced.

Following is MRC protocol for determining reproductive status of spotted owls. Reproduction surveys may provide information on nest tree locations and the most accurate activity center locations. There are 2 stages of reproduction surveys: nesting status and reproductive success.

##### **K.5.3.1.1 Nesting Status**

- Conduct nesting status surveys between March 11<sup>th</sup> and June 15<sup>th</sup>. The start date is based on nest initiation dates. Young identified after June 15 still confirm nesting.
- Spread the surveys throughout the survey period. Do not conduct all nesting status surveys early in the breeding season.
- Use a standard *mousing* procedure (section K.5.3.1.2) to determine nesting status. However, do not *mouse* birds any more than is necessary to determine nesting status. By stimulating them to move around during the day, you may increase their risk of predation. This applies to hooting as well. Excessive calling near a nest site may cause harassment and endanger eggs or young by bringing the female off the nest.

##### **K.5.3.1.2 Mousing**

- Locate one or both members of a pair during the day and offer mice or other small prey items.
- Record the *fate* of each prey item (e.g., eaten, cached, or given to female or young) once an owl takes prey or is found with natural prey. The fate of the prey is used to classify nesting status.
- Continue to offer additional prey items, if the owl eats the prey, until the owl caches the prey, sits on it for an extended period of time (60 minutes), refuses to take additional prey, or carries the prey away. If the bird flies with the prey, follow and try to determine the final fate of the prey. For more details on mousing procedures, see Forsman (1983).
- Make a concerted effort to get the owl(s) to take mice. Be creative in placing a mouse where the owl can easily see and capture it; offer mice to the mate of an owl.

### **K.5.3.2 Classifying sites**

MRC will classify a site as nesting, non-nesting, or unknown nesting status based on field observations.

#### **K.5.3.2.1 Nesting**

MRC will classify owls as nesting if any of the following conditions are observed:

- Two observations, at least 7 days apart, if the first observation occurs before May 15.

**NOTE**

This is necessary because owls may show signs of initiating nesting early in the season. A surveyor may consider them nesting when, in fact, they are not nesting. For instance, a female observed on a nest early in the season may simply be roosting and not incubating eggs.

- One observation, if after May 1.

Nesting is confirmed if, on 2 visits before May 15 or 1 visit after May 1, any of the following apply:

- The female is observed on a nest.
- Either member of a pair carries natural or observer-provided prey to the nest.
- A female possesses a brood patch when examined in hand during mid-April to mid-June. Only 1 observation is required. Dates may vary with the particular areas. Be careful not to confuse the normal small area of bare skin (apteria) on the abdomen with the much larger brood patch. A fully developed brood patch covers most of the lower abdomen, extending to the base of the wings. Describe the brood patch on the field form, including length, width, color, and texture of the skin, and any evidence of regenerating feathers around the edge. While a scientific research permit is not required by USFWS for calling spotted owls, any capture or handling of spotted owls does require such a permit.
- One or both adults are observed with young. Because young barred owls look like young spotted owls until late in the summer, young alone are not sufficient.

#### **K.5.3.2.2 Non-nesting**

Except for brood patch information, 2 observations are required during the nest survey period, with at least 3 weeks separating these observations to ensure that late nesting attempts are not missed. The second observation should occur after April 15<sup>th</sup>. Because nesting attempts may fail before surveys are conducted, the non-nesting status includes owls that did not attempt to nest as well as those that have failed.

Non-nesting can be inferred if any of the following apply:

- The female is observed roosting for 60 minutes, particularly early in the season (March 11 to May 15). Be aware that nesting females with large nestlings often roost outside the nest during warm weather. If in doubt be sure to schedule 1 or more visits in mid-June to check for fledglings.

- The female does not possess a brood patch when examined in hand between mid-April and mid-June.
- Prey are offered to one or both adults and they cache the prey, sit with the prey for an extended period of time (60 minutes), or refuse to take additional prey beyond the minimum of 2 prey items.
- One or both spotted owls refuse to take prey for 60 minutes. This can only count for one of the two required visits to infer non-nesting; the other visit must use the procedure outlined above to infer non-nesting status.

Non-nesting can be inferred between May 16 and July 31:

- A pair is located between May 16 and July 31 on at least 2 occasions separated by at least 7 days.

AND

- Prey are offered to one or both adults and they cache the prey, sit with the prey for an extended period of time (60 minutes), or refuse to take additional prey beyond the minimum of 2 prey items.

OR

- One or both spotted owls refuse to take prey for 60 minutes; this can only count for 1 of the 2 required visits.

#### **K.5.3.2.3 Unknown nesting status**

Nesting status is unknown if any of the following apply:

- Nesting is not determined before June 1.
- Owls are found after June 1 without young.
- No owls are found after June 1 (at sites where they were present prior to June 1).

#### **K.5.3.3 Reproductive success**

Once an owl pair is classified as nesting, MRC will conduct reproductive success surveys when the young leave the nest (fledge)—although surveys are more successful in late May to late June. Surveyors may also assess reproductive success through the month of July and even later with positive results.

- Schedule at least 2 visits to a site to locate and count fledged young if 1 or 0 fledglings have been located; time the visits so that the fledged young are observed as soon as possible after they leave the nest to reduce predation.
- Attempt to locate fledged young. Use visual searches and mousing. If young are present, the adults should take at least some of the prey to the young. The sight of an adult with prey will usually stimulate the young to beg, revealing their number and location.
- Record 0 young if the birds take at least 2 prey items and eventually cache, sit with, or refuse further prey without ever taking prey to fledged young—on at least 2 occasions separated by at least 1 week.

- Count the number of fledged young seen or heard on the first successful reproductive visit. If 2 or 3 fledged young are identified, the reproductive status is complete.
- Conduct a minimum of 1 follow-up visit if only 1 fledged young is seen; the visit should be 3-10 days after the fledged young is seen in case some owlets are missed on a single visit.
- Classify the production of young as unknown, if there is no response after at least 2 visits, separated by at least 1 week during the fledging period.
- Classify the number of young as 1+, 2+, etc., if you count young on 1 visit but do not get back for a second visit, or find no owls on the second visit.

Opportunistic mousing late in the season (July 31) may be useful for providing supplemental information about site productivity. However, mousing efforts late in the season must be considered inconclusive if they fail to provide positive information, because dispersal or mortality may have occurred.

#### K.5.4 Protocol for determining activity center

Figure K-4 illustrates the decision process that MRC uses every year to select an activity center for each spotted owl territory. In reviewing the decision process, a few points should be noted: (1) MRC may locate an owl pair from auditory input, but at least one member of the pair must actually be observed; (2) MRC will select the most-used roost site (based on observations, presence of whitewash, and presence of pellets) in the event of multiple roost sites; and (3) MRC may consult with USFWS and CDFG and designate an alternate activity center, if the decision flow does not result in the most biologically suitable location.

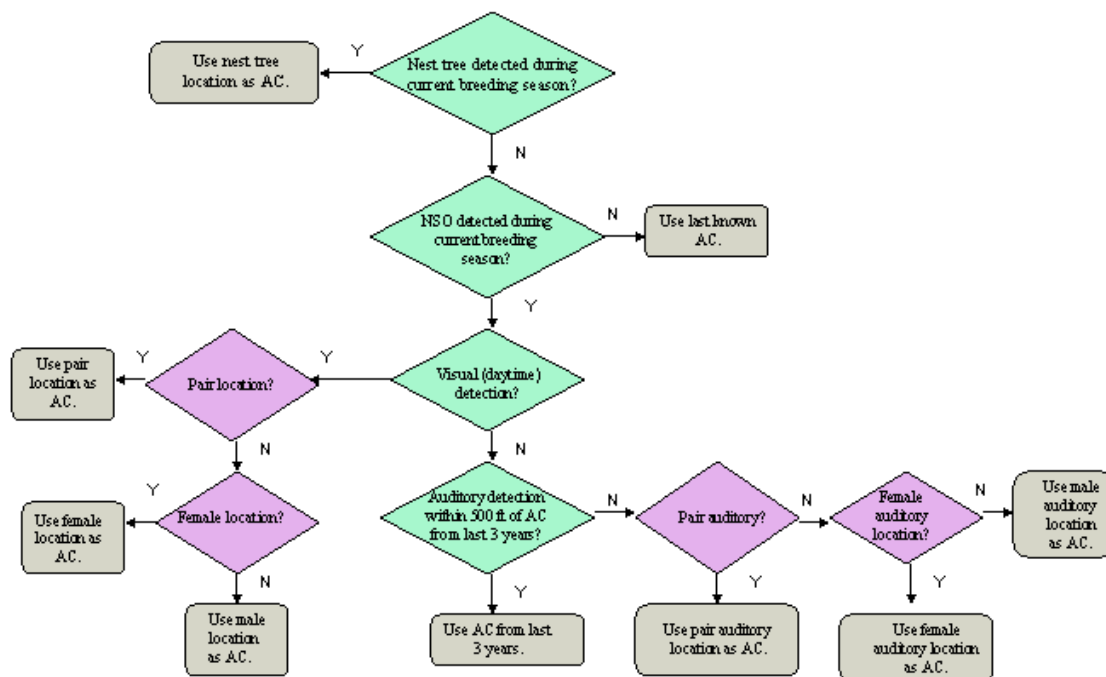


Figure K-4 Selecting an Activity Center



## **K.6 Spotted owl banding protocol**

### **K.6.1 Authorized individuals**

Only individuals authorized by the wildlife agencies may conduct banding activities. To request additional authorized individuals, MRC will submit 2 copies of a written request to the wildlife agencies at least 30 days prior to the effective date. The lead bander will sign and date the request that includes

1. Name of each individual to be appended to the list.
2. Resume or qualifications statement for each person to be appended to the list, detailing his or her experience with each species and type of activity for which authorization is requested.
3. Names and phone numbers of at least 2 references.
4. Names of individuals to be deleted from the list.

### **K.6.2 Banding of northern spotted owls**

#### **K.6.2.1 Provisions for banding owls**

All authorized individuals are authorized to capture spotted owls within covered lands, as well as spotted owls previously banded or thought to be previously banded on covered lands. Captured spotted owls may be banded, held for no more than 30 minutes, and then released at the capture site, provided that

1. Adult and juveniles owls are captured by hand, noose pole, noose snare, dip net, balchatri, dho-gaza, or mist net.
2. Activities on land adjacent to covered lands are coordinated with managers of those lands to reduce handling of birds and eliminate possible cumulative impacts on owls. When previously banded birds are captured for identification purposes, all reasonable attempts will be made to contact and exchange information with the individual who originally banded the bird.
3. Owls distinguishable by color-marked or radio tags from other research projects are not recaptured by persons authorized under this permit, except with authorization of appropriate research project leader.
4. All banding is coordinated through the banding contact at the Arcata Fish and Wildlife Office and with adjacent project managers authorized under other permits.
5. Captured birds are processed efficiently and held less than half an hour.
6. No females are captured during March 15 through May 15, unless they are determined to be non-breeding.
7. Juvenile owls are not captured until they have been out of the nest for at least 2 weeks and are capable of independent flight.
8. Captors do not climb over 2 meters during capture attempts, except to release a tangled bird from a noose or other device.
9. No attempts are made to capture an owl when ambient air temperature at or below 5<sup>0</sup> C or during periods of precipitation.
10. Captors follow the guidelines for handling and collecting tissue (e.g. blood, feathers).

#### **NOTE**

Strict protocols, agreed upon by MRC and the wildlife agencies prior to the banding season, will limit the amount of collection materials. The wildlife agencies will determine the appropriate limits on an annual basis or less frequently, if they so choose.

- a. Take precautions to prevent the spread of disease from one owl to another, including the use of sterile equipment and the proper disposal of used equipment.
- b. Provide tissue samples to any scientist approved by the wildlife agencies for the purpose of laboratory analysis.



11. Collection is limited to 4 non-flight or body feathers (flight feathers lost incidentally during capture or processing will be collected and substituted for the non-flight or body feathers).
  - a. Label all feather samples and store them in a dry container or alcohol until ready for analysis.
  - b. Make feathers available to other researchers with concurrence from the wildlife agencies.

#### **K.6.2.2 Guidelines for handling and reporting injured or killed owls**

The allowable number of spotted owls that can be incidentally injured (debilitated) or killed during capture or handling is 2 in any calendar year. The following guidelines apply anytime an owl is incidentally injured or killed:

1. Perform a necropsy to determine cause of death (generally performed by a veterinary expert), if an owl is killed in the course of banding and/or the cause of death is unknown.
2. Transport injured owls immediately to the nearest veterinary hospital with facilities to treat injured birds.
3. Report the occurrence and disposition of any incidentally injured or killed owls within 3 working days to the wildlife agencies.
4. Adhere to the following procedures in the event the number of owls allowed to be incidentally injured or killed is met:
  - a. Cease capturing or handling immediately until reauthorized by the wildlife agencies, which may, after analysis of the circumstances of mortality or injury, revoke or amend this permit.
  - b. Notify the wildlife agencies immediately and follow up with written notification within 3 working days of the incident.
  - c. Provide a report of the circumstances that led to the injury or mortality, including date, time, precise location, pertinent information (e.g., cause of death or injury), and measures taken to reduce the likelihood of a similar incident occurring again.
6. Bag, freeze, properly labeled, and deposit specimens at a designated depository.
7. Supply the depository with evidence that specimens were taken pursuant to the permit.

MRC must salvage all owl carcasses and deposit them with a designated depository. The initial designated depository is Humboldt State University, Department of Wildlife, Arcata, California; however, the wildlife agencies can add to or remove depository facilities at any time. For all owls killed, MRC will complete a California Natural Diversity Database form and submit it to the Natural Diversity Database, CDFG – NHD, 1416 Ninth Street, 12th Floor, Sacramento, California, 95814 with copies forwarded to the wildlife agencies.

#### **K.7 Survey plan for determining population trends**

To follow trends in spotted owl territories, MRC will survey its entire forest lands over a 5-year period. Sample units will be inventory blocks. We have specifically scheduled survey of inventory blocks to distribute our survey effort equally over time and space. This will limit the potential geographic effects (such as a lag in productivity and occupancy in our more northern tracts) and annual climate effects. For a map of inventory blocks and planned survey efforts, see Appendix B, *HCP/NCCP Atlas*, Maps 14a-c.

During the course of a year, wildlife staff will conduct night calls at survey points within assigned inventory blocks; they will conduct these night calls 3 times at each survey point in order to get an accurate count of territories and distinguish detections of spotted owls and barred owls. MRC will repeat this survey every 5 years within each inventory block for the full term of the HCP/NCCP. We will use the survey protocol outlined in section K.5.2, including for follow-ups on new detections. To ensure that owls are not “over-called,” we will coordinate surveys for population trends with project surveys and other monitoring efforts.

Tables K-6 through K-10 show for each inventory block the number of survey stations and the mean acreage covered by each survey point. Some watersheds have more area and greater road density and, therefore, more survey stations. While survey stations are generally 0.25 to 0.5 miles away from each other, on covered lands the minimum distance between 2 survey stations is approximately 1000 ft and the maximum distance approximately 0.75 miles. Issues of road access or topography usually account for stations that exceed the 0.5 mile distance. Appendix B, *HCP/NCCP Atlas* (Maps 14a-c), contains maps of the current survey stations. Once an activity center is located, MRC will not make any night calls within 0.5 miles of it unless it becomes necessary in order to locate another owl territory<sup>4</sup> or to relocate a mobile owl activity center during the breeding season. This will insure we do not cause undue stress to breeding spotted owls.

**Table K-8 Trend Monitoring of Spotted Owls: YEAR 1**

<b>Inventory Block</b>	<b>Survey Stations</b>	<b>MRC Acres</b>	<b>Mean Acres per Station</b>
Albion	273	14797	54
Navarro East	437	30863	71
<b>TOTAL</b>	<b>710</b>	<b>45660</b>	<b>64</b>

**Table K-9 Trend Monitoring of Spotted Owls: YEAR 2**

<b>Inventory Block</b>	<b>Survey Stations</b>	<b>MRC Acres</b>	<b>Mean Acres per Station</b>
Navarro West	443	23549	53
Noyo	324	19350	60
<b>TOTAL</b>	<b>767</b>	<b>42899</b>	<b>56</b>

**Table K-10 Trend Monitoring of Spotted Owls: YEAR 3**

<b>Inventory block</b>	<b>Survey Stations</b>	<b>MRC Acres</b>	<b>Mean Acres per Station</b>
Rockport	485	38427	79
Ukiah	47	3591	76

<sup>4</sup> This may occur when spotted owl activity centers are closer than 0.5 miles to each other. MRC may need to call within 0.5 miles of one territory to locate an activity center of another territory.

Inventory block	Survey Stations	MRC Acres	Mean Acres per Station
<b>TOTAL</b>	<b>532</b>	<b>42018</b>	<b>79</b>

**Table K-11 Trend Monitoring of Spotted Owls: YEAR 4**

Inventory block	Survey Stations	MRC Acres	Mean Acres per Station
Big River	387	33479	87
Garcia	271	14906	55
<b>TOTAL</b>	<b>658</b>	<b>48385</b>	<b>74</b>

**Table K-12 Trend Monitoring of Spotted Owls: YEAR 5**

Inventory Block	Survey Stations	MRC Acres	Mean Acres per Station
South Coast	559	34281	61
<b>TOTAL</b>	<b>559</b>	<b>34281</b>	<b>61</b>

